

**EG&G ROCKY FLATS**  
**ENVIRONMENTAL MANAGEMENT**  
**DEPARTMENT**

**DOCUMENT REVIEW SHEET**

Page 1 of 2

PLEASE REVIEW THE ATTACHED DOCUMENT, NO. 4-B01-ER-OPS-OM 01

REV      DRAFT     

TITLE Collection of Floor/Equipment Rinsate Samples

DIRECT TECHNICAL CONTENT QUESTIONS TO THE WRITER P Bierbaum Ext 741-5050

COMPLETE THE FOLLOWING AND RETURN THIS SHEET TO      BY      /      / 93

     NO COMMENT

     COMMENTS ARE RECOMMENDATIONS TO BE CONSIDERED BY THE RESPONSIBLE MANAGER

     COMMENTS SHOWN BELOW ARE TO BE DISPOSITIONED BEFORE THE DOCUMENT IS SUBMITTED FOR APPROVAL

SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (Initial)
Major Concern No 1	See attached sheet	See attached sheet	
Major Concern No 2	See attached sheet	See attached sheet	
Specific Comment No 1	See attached sheet	See attached sheet	

"REVIEWED FOR CLASSIFICATION" CL-104

By [Signature]

Date 01-12-94

A-OU15-000076

REVIEWER (PRINT) <u>DOE</u>	PHONE <u>    </u>	DATE <u>    </u>	DEPT <u>    </u>
SIGNATURE OF REVIEWER <u>    </u>			
REVIEW TYPE <u>    </u> INDEPENDENT <u>    </u> QA <u>    </u> PEER REVIEW <u>    </u> OTHER <u>    </u>			



# Response to DOE Comments on the Collection of Floor/Equipment Hot Water Rinsate Samples SOP for the OU 15 Phase I RFI/RI

May 21, 1993

## Major Concerns

- Comment** It appears that the procedure as described in the SOP will not meet the objectives stated for the sampling. The sampling objectives include qualitative and quantitative analysis of floor surface contamination, assessment of the contaminant's potential migration, and evaluation of the health and safety risks within the six rooms. The procedure described is as follows: hot water (140° to 160° F) is applied at a moderate pressure (90 to 100 psi) to floors or equipment. The water is collected in a vacuum system and subsequently transferred to bottles for chemical analysis. Samples are analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), soluble metals, cyanide, and soluble radionuclides. The sample procedure gives no direct measurement of floor or equipment contamination. It will, in addition, seriously compromise sample integrity for many of the analytes, destroying any possible correlation between surface contamination or leaching potential and rinsate concentrations. For example, analyzing for VOCs or SVOCs after the water has passed through a vacuum system will not provide accurate concentrations. It is recommended that the sampling approach be redesigned to meet the stated objectives.

**Disposition** Hot water rinsate sampling was chosen as a sampling method for the OU 15 Phase I RFI/RI to help meet the sampling objectives presented in the OU 15 Work Plan. These objectives consist of a qualitative and quantitative analysis of floor surface contamination, assessment of the contaminant's potential for migration, and evaluation of the health and safety risks associated with the six IHSSs. The OU 15 Work Plan, which was approved by CDH and EPA, establishes three separate sampling methods for Stage I and II of the OU 15 field investigations. The sampling methods are (1) swipe sampling and analysis of IHSS surfaces for removable radiological contamination, (2) sampling and analysis of hot water rinsate sampling to determine the presence or absence of IHSS-associated contamination, as well as to verify Clean Closure Performance Standards, and (3) radiological surveys for fixed radiological contamination followed by a gamma-dose rate survey.

Hot water rinsate sampling was selected as one of the OU 15 sampling methods because it is non-destructive, can safely be performed within the buildings and can provide the data necessary to meet the sampling objectives. Closure Performance Standards have been proposed for rinsates in the RFP RCRA permit and in RFP RCRA closure plans submitted for interim status units to be closed. Standards have been proposed for a series of contaminants, including a number of volatile organic compounds, and are typically ten

times the Drinking Water standard for the particular contaminant. This approach is consistent with standards that have been accepted by CDH for other closure plans. The Closure Performance Standards provide a limit to which the results of OU 15 hot water rinsate samples can be meaningfully compared.

Hot water rinsate sampling is also representative of the methods (e.g., steam cleaning or technology-based closure methods) that could potentially be used to close units at RFP. The hot water and vacuum effects of the system will tend to volatilize a certain portion of volatile compounds, but they will also tend to mobilize them and allow for some collection of these compounds in the rinsate. Although the recovery of volatile compounds may not be complete, an indication of the presence of these contaminants on equipment and floor surfaces should result.

Direct sampling of equipment and concrete floors was considered as a sampling method, since it provides a direct measure of contamination on the surface and within the material being sampled. This method was dismissed, however, for health and safety reasons and because of operational constraints within the buildings. It was determined that potential health and safety risks to samplers and building personnel could result from the disturbance caused by the collection of intrusive samples from floors and equipment associated with past building operations. In addition, the removal of portions of the concrete floors, which can create problems such as breaching the building's secondary containment system, is not desirable in buildings with on-going operations.

Dry wipe sampling of floor and equipment surfaces was also considered as a sampling method for the OU 15 field investigations. As described in the OU 15 Work Plan, swipe samples will be taken in each IHSS to measure levels of removable radiological contamination. This sampling method is well established at RFP and will provide very useful information on removable radiological contamination. It was determined, however, that dry wipe samples would not be as useful as hot water rinsate samples in assessing the potential for the mobilization and migration of both organic and inorganic constituents.

- 2 **Comment** The sampling approach proposed does not correspond to generally accepted procedures. U.S. Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste" SW-846 (1983) sampling methods (EPA SW-846) should be used for the VOCs, SVOCs, metals, and cyanides. The generally accepted sampling procedure for floor and equipment surface radioactivity is taking dry wipes of suspect areas. Use of nonstandard techniques will make it difficult or impossible to compare analytical results with the results of other techniques or with standards.

**Disposition** Standard techniques for sampling floors are not described in SW-846 (1986), therefore, use of a method that provides a representative sample is deemed to be appropriate. Furthermore, while the sample results produced may not be directly comparable to other sampling methods, the results will be comparable to the Closure Performance Standards proposed in RFP's RCRA permit and interim status closure plans.

Wipe sampling will be used in assessing radiological and beryllium (if appropriate) contamination in each of the IHSSs. Wipe sampling will be performed prior to conducting the hot water rinsate sampling.

### Specific Comments

- 1      **Comment** Section 4.1, p. 3, bottom of page. EPA SW-846 (1983) should be added to the list of references.

**Disposition** Comment incorporated. EPA SW-846 (1986) has been added to the list of references in section 4.1.

- 2      **Comment** Section 4.2, p. 4, last bullet. It is unclear whether SOP SW 2 is applicable to this project. Please clarify.

**Disposition** SOP SW 2 describes the procedures necessary to measure the pH, temperature and conductivity (specific conductance) of the rinsate sample. The specific reference to this SOP is called out in Section 5.3.5.

- 3      **Comment** Table SW 72. The containers, preservatives, and holding times specified on this table imply that samples will be analyzed at an off-site laboratory at Level III or Level IV. The sample collection technique will seriously compromise sample integrity making the expense of analysis at these levels unwarranted.

**Disposition** A minimum of Level III procedures have been determined to be necessary in order to specifically quantify the levels of contaminants which may be present within each IHSS. Use of Level I or II procedures will not provide the quantitative data necessary for comparison with the Closure Performance Standards required by the involved regulatory agencies.

Response to CDH Verbal Comments via Dennis Schubbe of EG&G on the Collection of Floor/Equipment Hot Water Rinsate Samples SOP for the OU 15 Phase I RFI/RI

May 21, 1993

The following dispositions have been developed in response to the verbal comments from CDH that were received by Dennis Schubbe of EG&G on May 14, 1993. These dispositions are provided for DOE review and have not been transmitted to CDH.

Comments

- 1 **Comment** CDH expressed concern with the hot water rinsate sampling methodology, specifically as it relates to the collection and retention of organic constituents in the rinsate. CDH indicated that the hot water and vacuum effects of the sampling system will compromise the ability to collect representative organic samples. CDH asked for clarification on why hot water rinsate sampling was selected.

**Disposition** Hot water rinsate sampling was chosen as a sampling method for the OU 15 Phase I RFI/RI to help meet the sampling objectives presented in the OU 15 Work Plan. These objectives consist of a qualitative and quantitative analysis of floor surface contamination, assessment of the contaminant's potential for migration, and evaluation of the health and safety risks associated with the six IHSSs. The OU 15 Work Plan, which was approved by CDH and EPA, establishes three separate sampling methods for Stage I and II of the OU 15 field investigations. The sampling methods are (1) swipe sampling and analysis of IHSS surfaces for removable radiological contamination, (2) sampling and analysis of hot water rinsate sampling to determine the presence or absence of IHSS-associated contamination, as well as to verify Clean Closure Performance Standards, and (3) radiological surveys for fixed radiological contamination followed by a gamma-dose rate survey.

Hot water rinsate sampling was selected as one of the OU 15 sampling methods because it is non-destructive, can safely be performed within the buildings and can provide the data necessary to meet the sampling objectives. Closure Performance Standards have been proposed for rinsates in the RFP RCRA permit and in RFP RCRA closure plans submitted for interim status units to be closed. Standards have been proposed for a series of contaminants, including a number of volatile organic compounds, and are typically ten times the Drinking Water standard for the particular contaminant. This approach is consistent with standards that have been accepted by CDH for other closure plans. The Closure Performance Standards provide a limit to which the results of OU 15 hot water rinsate samples can be meaningfully compared.

Hot water rinsate sampling is also representative of the methods (e.g. steam cleaning or technology-based closure methods) that could potentially be used to close units at RFP. The hot water and vacuum effects of the system will tend to volatilize a certain portion of volatile compounds, but they will also tend to mobilize them and allow for some collection of these compounds in the rinsate. Although the recovery of volatile compounds may not be complete, an indication of the presence of these contaminants on equipment and floor surfaces should result.

Direct sampling of equipment and concrete floors was considered as a sampling method, since it provides a direct measure of contamination on the surface and within the material being sampled. This method was dismissed, however, for health and safety reasons and because of operational constraints within the buildings. It was determined that potential health and safety risks to samplers and building personnel could result from the disturbance caused by the collection of intrusive samples from floors and equipment associated with past building operations. In addition, the removal of portions of the concrete floors, which can create problems such as breaching the building's secondary containment system, is not desirable in buildings with on-going operations.

Dry wipe sampling of floor and equipment surfaces was also considered as a sampling method for the OU 15 field investigations. As described in the OU 15 Work Plan, swipe samples will be taken in each IHSS to measure levels of removable radiological contamination. This sampling method is well established at RFP and will provide very useful information on removable radiological contamination. It was determined, however, that dry wipe samples would not be as useful as hot water rinsate samples in assessing the potential for the mobilization and migration of both organic and inorganic constituents.

- 2 **Comment** CDH stated that the volume of rinsate water applied to the surfaces being sampled will affect the contaminant concentration levels in the rinsate samples. CDH was concerned with how the hot water rinsate sampling system will be operated to prevent unrepresentative dilution of the rinsate samples.

**Disposition** To ensure comparability with the Closure Performance Standards proposed in RFP's RCRA permit and interim status closure plans, the application rate for the hot water rinsate sample collection system will be maintained at less than or equal to the rate presented in the Closure Plan section of the existing RFP RCRA permit. For indoor storage areas, the permit specifies a used cleaning solution generation rate of 50 gallons for completing a wash and rinse cycle on 150 square feet of area. By extension, a single rinse of the hot water rinsate sample collection system should generate no more than 25 gallons per 150 square feet, or 0.17 gallons per square foot. Maintaining an application rate at or below this value will ensure consistency between the analytical results from the

rinsate samples and the Closure Performance Standards, and will prevent unrepresentative dilution of the rinsate samples. In the interest of waste minimization, efforts will be made to limit the generation of rinsate to the volume required for the laboratory samples.

- 3 **Comment** CDH asked how contaminant concentrations in the hot water rinsate will relate to contaminant concentrations present on the floor and equipment surfaces that are being sampled.

**Disposition** The concentration of contaminants in a rinsate that has been applied to and collected from a floor or equipment surface is not a direct measurement of contamination on that surface. However, the measurement of contaminant concentrations in rinsate does serve two purposes. For a given sample area and a known volume of rinsate collected from that area, a relationship between rinsate contaminant concentrations and surface contaminant concentrations can be established. Rinsate contaminant concentrations are typically reported in milligrams or micrograms per liter of rinsate, which represents the contaminant mass per unit volume of rinsate. The total mass of a contaminant collected can be calculated by multiplying the concentration of that contaminant by the total volume of rinsate collected. The total contaminant mass collected can then be divided by the surface area sampled to yield the mass of recovered contaminant per square foot of area.

The rinsate contaminant concentrations can also be compared directly to the Closure Performance Standards proposed in RFP's RCRA permit and interim status closure plans. The OU 15 Work Plan listed the RCRA Closure Performance Standard as one of the two ARARs identified for OU 15. If rinsate contaminant concentrations are below the Closure Performance Standard limits, no further action will be proposed with regards to this ARAR. Conversely, if rinsate contaminant concentrations exceed the Closure Performance Standard limits, further action will be required.